

CLAIMS 8 AND 9 ARE REJECTED UNDER 35 U.S.C. § 102 AS BEING ANTICIPATED BY

HIRUKAWA, JP 6-120116

In the third enumerated paragraph of the Office Action, the Examiner asserted that Hirukawa discloses a focus monitoring apparatus corresponding to that claimed. This rejection is respectfully traversed.

Applicants initially note that the Examiner relied on Hirukawa to identically disclose the claimed invention but only the abstract of Hirukawa has been translated into English. In this regard, Applicants note the following commentary in Ex parte Gavin¹ by the Honorable Board of Patent Appeals and Interferences:

Generally an abstract does not provide enough information to permit an objective evaluation of the validity of what it describes ... Abstracts function to alert a reader to disclosures of possible interest. They are little more reliable than headlines or brief newspaper articles.

For this reason, the Board opined that "a proper examination under 37 C.F.R. § 1.104 should be based on the underlying documents and translations, where needed." The Board further stated that "obtaining translations is the responsibility of the examiner." On this basis, Applicants respectfully request the Examiner provide a translation of Hirukawa so that Applicants can objectively evaluate the complete disclosure of Hirukawa.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the identical disclosure of each element of a claimed invention in a single reference. As part of this analysis, the Examiner must (a) identify the elements of the claims, (b) determine the meaning of the elements in light of the specification and prosecution history, and (c) identify corresponding elements disclosed in the allegedly anticipating reference. That burden has not been discharged,

as the Examiner has failed to meet each of these requirements. In addition, the Examiner neither clearly designated the teachings in Hirukawa being relied upon nor clearly explained the pertinence of Hirukawa. In this regard, the Examiner's rejection under 35 U.S.C. § 102 also fails to comply with 37 C.F.R. § 1.104(c).² The Examiner's sole statement with regard to the rejection of claims 7 and 8 is as follows:

The focus monitoring apparatus used for pattern formation of a semiconductor device as claimed is clearly described, shown and suggested by the Japanese document. See specifically the Figures and Abstract of the Disclosure.

The Examiner's citation to the Figures and Abstract of the Disclosure of Hirukawa does not meet the required standard of clearly designating the teachings in Hirukawa being relied upon. Thus, the Examiner has failed to establish a prima facie case of anticipation based upon Hirukawa. Furthermore, the Examiner's rejection is improperly placing the burden of proof on Applicants to establish that the cited reference does not disclose the claimed invention. This shifting of the burden of proof, however, cannot occur unless the Examiner has established a prima facie case of anticipation, which has not occurred.

Notwithstanding the Examiner's failure to point out where the claimed features are disclosed within Hirukawa, Applicants note that claim 8 recites "directing non-telecentric illuminating light obtained by controlling a shape of an opening of an illumination aperture included in said illumination optical system onto said photomask." As described on page 10,

¹ 62 USPQ 2d 1680 (BPAI 2001).

² 37 C.F.R. § 1.104(c) provides:

In rejecting claims for want of novelty or for obviousness, the examiner must cite the best references at his or her command. When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified.

lines 16-22 of the application, "non-telecentric illumination" is defined as illumination that is not telecentric illumination, and more specifically, is defined as illumination in which the intensity distribution of the illuminating light is asymmetric with respect to the optical axis of the illumination optical system (illumination in which the barycenter in the intensity distribution of the illuminating light is off the optical axis).

Referring to Figs. 1 and 2 of Hirukawa, the pattern (25 or 28) of the mask (17A or 17B) is illumination with the exposure light having a principal ray inclined with respect to the optical axis of the projection system (19). In order to incline the principal ray of the exposure light with respect to the optical axis, the diffraction grating pattern (29) is provided on the upper surface of the mask (17 or 17C) in Hirukawa, as shown in Figs. 4 and 5 of Hirukawa. By directing primary diffracting light produced by the diffraction grating pattern (29) onto the mark (18A, 18B or 18C, 18D), the mark is illuminated with the exposure light having a principal ray included with respect to the optical axis. Hirukawa does not teach using non-telecentric illumination obtained by controlling a shape of an opening of an illumination aperture included in the illumination optical system, as recited in claim 8, and thus, Hirukawa fails to identically disclose the claimed invention within the meaning of 35 U.S.C. § 102. Applicants, therefore, respectfully solicit the withdrawal of the imposed rejection of claims 8 and 9 under 35 U.S.C. § 102 for lack of novelty as evidenced by Hirukawa.

CLAIMS 1-7 ARE REJECTED UNDER 35 U.S.C. § 103 FOR OBVIOUSNESS BASED UPON

HIRUKAWA IN VIEW OF KING ET AL., U.S. PATENT NO. 5,952,132 (HEREINAFTER KING)

In the fourth enumerated paragraph of the Office Action, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify the focus monitoring methodology of Hirukawa in view of King to arrive at the claimed invention. This rejection is respectfully traversed.

In the statement of the rejection, the Examiner asserted with regard to Hirukawa that "[a] careful review of the Figures and translation show that non-telecentric illumination is utilized to perform focus monitoring of the patterned image of the photomask." Applicants note, however, that this assertion does not address the specifically claimed limitation of "directing non-telecentric illuminating light obtained by controlling a shape of an opening of an illuminating aperture onto the photomask" (emphasis added). Not only does Hirukawa fail to teach controlling a shape of an opening of an illuminating aperture, the Examiner has failed to establish that this feature is disclosed by either Hirukawa or King. Thus, even if the applied prior art were combined in the manner suggested by the Examiner, the claimed invention would not result.

With regard to the teachings of King, the Examiner stated:

However, King et al. describes a method of forming a stepper focus pattern through determination of overlay error that is extremely similar to the focus monitoring method of the instant application and that of the Japanese document relied upon by the Examiner. In the document of King et al., it is shown that a box with a box pattern is utilized, with relative displacement of the patterns transferred onto the photoresist to perform focus monitoring.

This is the only statement made by the Examiner regarding the features in King being relied upon by the Examiner. As such, Applicants respectfully submit that the Examiner's rejection does not

comply with 37 C.F.R. § 1.104(c) since the Examiner has failed to clearly designate the teachings in Hirukawa being relied or clearly explain the pertinence of Hirukawa. In particular, Applicants note that the Examiner has failed to establish where all of the claimed features are taught or suggested by either Hirukawa or King.

With regard to the requisite motivation to combine, the Examiner asserted:

Although King et al. does not describe non-telecentric illumination, one of ordinary skill would have found it prima facie obvious to utilize the best focus measuring method of the Japanese document in combination with the box within a box mark with a reasonable expectation of achieving a highly useful focus measuring method as set forth in the Japanese document absent objective evidence of high probative value to the contrary.

Applicants submit that the Examiner has not established a prima facie basis to deny patentability to the claimed invention under 35 U.S.C. § 103 for lack of the requisite factual basis and lack of the requisite realistic motivation.³ In condensing the Examiner's arguments, the Examiner is arguing that it would have been obvious to use the features of King with Hirukawa to achieve a highly useful focus measuring method absent "objective evidence of high probative value to the contrary." There is, however, no factual basis for these assertions. The Examiner's assertion that one having ordinary skill in the art would have "a reasonable expectation of achieving a highly useful focus measuring method" is a conclusory statement without any basis

³ In rejecting a claim under 35 U.S.C. § 103, the Examiner is required to identify a source in the applied prior art for: (1) claim limitations; and (2) the motivation to combine references or modify a reference in the reasonable expectation of achieving a particular benefit. Smiths Industries Medical System v. Vital Signs Inc., 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999). The requisite motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. § 103 is not an abstract concept, but must stem from the applied prior art as a whole and have realistically impelled one having ordinary skill in the art to modify a specific reference to arrive at a specifically claimed invention. In re Deuel, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995); In re Newell, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989).

in facts. The Examiner has already admitted that King does not describe non-telecentric illumination, and the Examiner has failed to establish that one having ordinary skill in the art would recognize that a method useful in telecentric illumination can also be used in applications using non-telecentric illuminations. Therefore, there is no basis for the Examiner's conclusion that one having ordinary skill in the art would enjoy a reasonable expectation of success in combining these two different methods.

Furthermore, the Examiner's statement of "absent objective evidence of high probative value to the contrary" is akin to putting the cart before the horse. As previously discussed with regard to rejections under 35 U.S.C. § 102, the initial burden of proof is on the Examiner, and not the Applicants. The same holds true for a rejection under 35 U.S.C. § 103. Applicants are under no burden to produce any evidence prior to the Examiner establishing a prima facie case of obviousness. As discussed above, the Examiner's arguments as to the obviousness of the claimed invention are not based on facts of record but on the Examiner's unsupported conclusions. Thus, the Examiner's requirement that Applicants submit "objective evidence of high probative value to the contrary" is premature since the Examiner has failed to establish a prima facie case of obviousness.

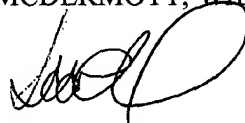
For the reasons stated above, Applicants submit that the imposed rejection of claims 1-7 under 35 U.S.C. § 103 for obviousness based upon Hirukawa in view of King is not factually or legally viable. Applicants, thus, respectfully solicit withdrawal of the imposed rejection of claims 1-7 under 35 U.S.C. § 103.

Applicants have made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. However, Applicants invite the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. Accordingly, and in view of the foregoing remarks, Applicants hereby respectfully request reconsideration and prompt allowance of the pending claims.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417, and please credit any excess fees to such deposit account.

Respectfully submitted,

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